Space Weather Forecast

Issued on Monday, 17 January 2022 at 12:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated M-class flares (R1/R2 radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with a single low level but long duration Common-Class flare from the current largest sunspot group in the northwest quadrant. There are currently 6 other sunspot regions on the visible disc. most of which are relatively small and simple. The spot group located north of the largest group in the northwest, is the next most significant group at present with a moderate size and complexity.

A CME from the 14th January may still give a weak glancing blow at Earth on the 17th, although this risk is diminishing. The long duration Common-class flare originating from the largest spot group, mentioned above, produced a CME directed mainly to the northwest. This has been initially analysed as missing Earth, but further analysis is pending to confirm this. There are no other Earth-directed CMEs visible in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind speeds are indicative of ongoing high speed stream influence. Wind speeds have been mostly at elevated levels, with occasional peaks into strong levels late UTC on the 16th.Total interplanetary magnetic field strength was weak throughout the period. The important north-south component was also weakly variable. Geomagnetic activity was Quiet to Active through to 16/0300UTC, becoming Quiet thereafter.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low with further Common-class flares expected, and a chance of isolated Moderate-class flares. Another two active regions are expected to rotate on from the far side within the next 24-48 hours, which may increase solar activity.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected, although a CME may still pass close to Earth on Day 1 (17 Jan), however this risk is diminishing. The solar wind is expected to remain elevated to slightly elevated on Days 1 & 2 (17-18 Jan), with a gradual return to background levels from Day 3 (19 Jan) as the effects of a coronal hole begin to wane. Unsettled to Active periods are likely early on Day 1 (17 Jan), with a slight chance of an isolated G1/Minor Storm still possible at first, due to a diminishing risk of a glancing blow from a close passing CME. Geomagnetic activity is then expected to decline to Quiet to Unsettled levels from Day 2 (18 Jan) onwards.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy

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protons) is forecast to remain at predominantly background levels with no solar radiation storms currently expected.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	40	40	40
Very Active	R3 to R5 X	No	2	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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